ʻŌhiʻa Rust

Background and Description: The neotropical rust disease *Puccinia psidii*, variously known as guava rust, Eucalyptus rust, and (very recently) ʻōhiʻa rust, is an emerging plant pathogen in the Pacific. Described in the 1880s as growing on leaves of native common guava (*Psidium guajava*) in Brazil, it spread by the 1950s to introduced plantations of Eucalyptus in Brazil, subsequently destroying the allspice (*Pimienta dioica*) industry in Jamaica. This pathogen is now recognized as a widespread pest in the neotropics with an unusually broad host range (potentially all family Myrtaceae). Symptoms of the disease first begin as tiny bright yellow powdery eruptions in a circular pattern on the leaf or stem surface. These infection foci or spots expand and spread, often killing leaves, stems, or shoots. Leaves and stems can be deformed by the disease, and growing tips can die back. Symptoms are most likely to be seen on tender, young growing tips. The long-term implications of ʻōhiʻa rust for ʻōhiʻa forests are uncertain. (See www.hawaiiag.org/hdoa/npa/npa05-04-ohiarust.pdf)

Introduction to the Pacific Islands: This rust was first found in Hawaii on an ʻōhiʻa plant (*Metrosideros polymorpha*) on Oʻahu in April 2005. It poses a formidable threat to Hawaii's ʻōhiʻa, a species that dominates perhaps 80% of Hawaii's forests and provides essential habitat to much of Hawaii's fauna. American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands have native Myrtaceae too, and although *Puccinia psidii* has not yet been documented on these islands, precautions are warranted.

Why and where this is a threat: Mycologists have called attention to adverse consequences of continuing introductions of pathogenic fungi. This causes increased pathogenicity and host range due to genetic recombination and hybridization. Although ʻōhiʻa rust has not been documented within PACN parks, it appears to be an imminent threat, especially to HAVO, HALE, and KALA where the ʻōhiʻa is a dominant tree species. Attention to this problem is also warranted for the Western Pacific: NPSA has five species of Myrtaceae, including the common *Syzygium inophylloides*, a bat dispersed species. In the Mariana Islands, the threat is likely similar to American Samoa, with a variety of native and non-native Myrtaceae present.

Experience from South Florida suggests multiple introductions over the past three decades may have broadened its host range. First found in Florida in 1977 on allspice, there was little notice of other hosts until 1997 - 1998, when an outbreak of the rust was noted on paperbark trees (*Melaleuca quinquenervia*). Since 1998 this invasive rust has become an increasing problem in Florida for commercial nurseries, homeowners, and native stands of certain Myrtaceae.

Management: An action plan with two basic provisions is needed: (1) Strategies to exclude from island groups any additional genetic material of ʻōhiʻa rust arriving via pathways such as nursery stock, seed and fruits, lumber and wood packaging material from any location where *Puccinia psidii* may be present, and (2) Monitoring throughout the geographic range of ʻōhiʻa rust (especially at high elevations), to determine the genetic composition (strains, or recognizable groupings of DNA) of rust populations present in the various island groups to assure that additional genotypes are not allowed to arrive. Close coordination between current plant quarantine efforts and surveillance of rust populations in the field is required. Surveillance must also include use of molecular tools, since genotypes cannot be recognized visually.

In Hawaii the initial response is to advocate tightened quarantine efforts to keep any additional genetic material of *Puccinia psidii* from entering the state. Such precaution is necessary to prevent the gradual deterioration of ʻōhiʻa forests.

For Questions or Comments Contact:
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How you can help:

Every citizen can do his or her part by becoming knowledgeable about invasive species issues and educating relatives, friends, and neighbors about gaps in our invasive species prevention system.

For updates and more information:
www.hear.org/species/puccinia_psidii/

ʻŌhiʻa Rust *(Puccinia psidii)* on the leaf of a Java Plum *(Syzygium jambos)* on Maui (August 2005).

Photograph courtesy of Forest and Kim Starr (USGS)